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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,314	11/26/2003	Bharath SV Kumar	140275-1	2929
6/147 7590 03/26/2009 GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309				
EXAMINER				
MOTSINGER, SEANT				
ART UNIT		PAPER NUMBER		
2624				
NOTIFICATION DATE		DELIVERY MODE		
03/26/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/724,314

Applicant(s)

KUMAR ET AL.

Examiner

SEAN MOTSINGER

Art Unit

2624

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,8,9,12 and 15-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,8-9,12,15-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response to Applicants Arguments/Amendments

Applicants arguments/amendments filed on 1/9/2009 have been entered and made of record.

Applicants arguments/amendments have been fully considered and not persuasive applicants statement that "Pasquet-Popescu and Perlman et al teach only 3 dimensional transformations of image data by simultaneously wavelet transforming each image in the x-axis, y-axis and z-axis" is incorrect. While Popescu does refer to a 3-d wavelet transform he most certainly does not simultaneously wavelet transform each image in all directions. In fact Popescu performs a temporal (z-axis) transformation on each group of frames, Then performs a spatial (x and y axis) transformation on the temporally transformed representation (as in applicants claim) which ultimately gives a 3d wavelet transformation as in applicants claim (see paragraph 29).

Regarding applicants arguments with respect to 35 U.S.C. 112 applicant's arguments have been fully considered but are not persuasive. Applicant has not corrected the confusion with regard to the Thick Slab's as described in the 112 rejections indicated below and new amendments cause further confusion.

Rejections Under 35 U.S.C. 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3,8-9,12,15-22 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. applicant claims "sub-groups" which are solely decomposed in the Z axis these subgroups (thick slabs?) appear to be further decompressed in the x-y direction in the following step forming a 3-d wavelet decomposition. They do not appear to be solely decomposed in the Z axis direction. Applicant has not disclosed any embodiment which is equivalent to claim 1.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1-3,8-9,12,15-22 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims recite "one thick slab" but fail to define a "Thick slab" it is unclear what a "thick slab" is in this context. Furthermore the specification does explicitly provide a definition of a "thick slab" and therefore the exact scope of this claim is unclear what the bounds are. For example Is a thick slab the same

as the subgroup of claim one? What is the difference if any?. Furthermore applicant claims "sub-groups" which are solely decomposed in the Z axis these subgroups (thick slabs?) appear to be further decompressed in the x-y direction in the following step. It is not clear what the word solely is intended to mean not does it appear that the subgroups are in-fact transformed "solely in the z-axis direction". Art has been applied to the claims below in the fashion best understood by the examiner.

Rejections Under 35 U.S.C. 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 5, 9, 12, 15, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pesquet-Popescu US 2002/0009233 in view of Pearlman et al US 6,674,911.

Re claim 1 Popescu discloses a method of processing image data comprising: receiving data indicative of a group of consecutive cross sectional images (video sequence paragraph 24), of a video (paragraph 24), each of the cross sectional images being perpendicular to a z-axis (temporal axis paragraph 24), the group of consecutive cross sectional images having a first axial resolution in a z-axis direction (temporal

resolution paragraph 25) and having a first spatial resolution in x-axis and y-axis directions orthogonal to the z-axis (figure 2 and figure 1 note the spatial axes of the frame are orthogonal to the temporal axis). Performing a wavelet transform on (sub band decomposition paragraph 24) a subgroup of cross-sectional images (group of frames paragraph 24) in the z-axis direction (temporal direction) to generate an axially transformed representation of the at least one sub group (temporally decomposition paragraph 29), having a second axial resolution lower than the first axial resolution (variety of temporal resolutions paragraph 24); performing a wavelet transform (paragraph 29) on the axially transformed sub-group in x-axis and y-axis directions (paragraph 29) to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab (spatio-temporal tree paragraph 29), the spatially transformed representation having a second spatial resolution lower than the first spatial resolution (paragraph 29 note that wavelet transform provides reduced resolution representation also see figure 2). The 3d sequence of cross sectional images of Popescu are of a video sequence and not of an image volume. Pearlman et al discloses that 3-d sub band coding (i.e. wavelet) for video are also useful in compressing volume images (column 4 lines 25-30 and column 3 lines 40-67)

Re claim 2 Popescu further discloses generating reconstruction data (reconstruction paragraph 25) to allow reconstruction of the group from the axially transformed representation (paragraph 25);.

Re claim 5 Popescu further discloses performing entropy encoding of the axially transformed representation (paragraph 29).

Re claim 9 Popescu further discloses performing entropy encoding of the spatially transformed representation (paragraph 29).

Re claim 12 Popescu discloses a method of processing image data comprising: receiving data indicative of a group of consecutive cross sectional images (video sequence paragraph 24), of a video (paragraph 24), each of the cross sectional images being perpendicular to a z-axis (temporal axis paragraph 24); performing a wavelet transform on (sub band decomposition paragraph 24) the at least on thick slab representation (group of frames paragraph 24) in the z-axis direction (temporal direction) to generate a first transformed representation of the at least one subgroup (temporally decomposition paragraph 29), performing a wavelet transform (paragraph 29) on the first transformed representation in x-axis and y-axis directions (paragraph 29) orthogonal to the z axis direction to generate a spatially transformed representation of the first transformed representation of the sub group (spatio-temporal tree paragraph 29), wherein the transforming in two dimensions comprises performing at least one

level of wavelet decomposition. The 3d sequence of cross sectional images of Popescu are of a video sequence and not of an image volume. Pearlman et al discloses that 3-d sub band coding (i.e. wavelet) for video are also useful in compressing volume images (column 4 lines 25-30 and column 3 lines 40-67).

Re claim 15 Popescu further discloses performing entropy encoding (Paragraph 29) of at least one of the group consisting of the first transformed representation and the second transformed representation.

Re claim 22, Claim 22 is a computer processor configured to perform the method of claim 1. Popesque further discloses performing his method on a computer (see paragraph 004). Therefore claim 22 is likewise rejected see rejection of claim 1

Claim 3, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popescu and Perlman in view of Dekel US 2003/0005140.

Re claim 3 Popesque further discloses providing the axially transformed representation to a viewer (paragraph 25) and thick slabs (spatio-temporal tree paragraph 29). Dekel discloses progressively providing the reconstruction data (ROI data paragraph 12) to allow reconstruction of the image at the first resolution (lossless quality paragraph 12 and 13) based on the axially transformed representation. The motivation to combine Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed

and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Popescu and Perlman with Dekel to reach the aforementioned advantage.

Re claim 8 Popescue discloses providing the spatially transformed representation to a viewer and providing information to allow reconstruction of the at least one thick slab the spatially transformed representation (paragraph 25). Dekel discloses providing image data progressively (see paragraph 12). The motivation to combine is to provide progressive streaming see paragraph 12 .Therefore it would be obvious to combine Popescu and Perlman with Dekel to reach the aforementioned advantage.

Claims 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popescu and Perlman in view of Li US 6,567,081.

Re claim 18 Popescue and Perlman discloses all of the elements of claim 12 Li discloses further comprising encoding information in a data stream comprising information for progressively (column 17 lines 5-10) reconstructing the second transformed representation (the horizontal and vertical reconstruction column 19 lines 20-35), followed by encoding information for progressively reconstructing the first transformed representation (column reconstruction lines 30-35). The motivation to combine is to provide progressive reconstruction. (See column 17 lines 5-10).

Claims 20-21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popescu Perlman and Li in view of Dekel US 2003/0005140.

Re claim 20 Popescu Perlman and Li disclose all of the elements of claim 18 Dekel discloses progressively extracting at least a portion of the information (data blocks paragraph 237) from the data stream according to a desired level of viewing detail (resolution paragraph 237) of the three dimensional volume. The motivation to combine Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Popescu Perlman and Li with Dekel to reach the aforementioned advantage.

Re claim 21 Li discloses constructing the second transformed representation (the horizontal and vertical reconstruction column 19 lines 20-35), then reconstructing the first transformed representation (column reconstruction lines 30-35).

Dekel discloses to achieve a desired level of viewing detail (resolution paragraph 237) of the three dimensional volume. The motivation to combine Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Li with Dekel to reach the aforementioned advantage.

Claim 16, 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Popescu and Perlman in view of examiners official notice.

Re claim 16 Popescu and Perlman discloses all the elements of claim 12. Huffman coding is a notoriously well known method of entropy encoding. One of ordinary skill in the art would be capable of using Huffman encoding and the results would be predictable. Therefore one of ordinary skill in the art would have been obvious to one of ordinary skill in the art to combine Popescu and Perlman with Huffman encoding.

Re claim 17 The examiner is taking official notice that it is notoriously well known to use a Huffman look up table when doing Huffman encoding.. One of ordinary skill in the art would be capable of using Huffman lookup table and the results would be predictable. Therefore one of ordinary skill in the art would have been obvious to one of ordinary skill in the art to combine Popescu and Perlman with Huffman look up table.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popescu Perlman and Li in view of examiners official notice.

Re claim 19 The examiner is taking official notice that it is notoriously well known to use a Huffman look up table when doing Huffman decoding. One of ordinary skill in the art would be capable of using Huffman lookup table and Huffman encoding and the results would be predictable. Therefore one of ordinary skill in the art would have been obvious to one of ordinary skill in the art to combine Popescu Perlman and Li with Huffman look up table.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN MOTSINGER whose telephone number is (571)270-1237. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571)272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bhavesh M Mehta/
Supervisory Patent Examiner, Art Unit 2624

Motsinger
3/17/2009